About Fermi National Accelerator Laboratory

Fermilab is America's premier national laboratory for particle physics research, funded by the U.S. Department of Energy. Thousands of scientists from universities and laboratories around the world collaborate at Fermilab on experiments at the frontiers of discovery.

Wilson Hall is a landmark on the 6,800-acre site of Fermi National Accelerator Laboratory, located 40 miles west of Chicago in Batavia, Ill.

The challenge of particle physics is to discover what the universe is made of and how it works. By building some of the largest and most complex machines in the world, Fermilab scientists expand humankind's understanding of matter, energy, space and time, capturing imaginations and inspiring future generations.

Fermilab science

More than 4,200 scientists worldwide use Fermilab and its accelerators, detectors and computers for their research. About 2,500 researchers from 34 countries collaborate on experiments at Fermilab, keeping the United States at the leading edge of the international field of particle physics.

Fermilab produces the world's most intense beam of high-energy neutrinos, particles that may hold the key to understanding why the universe is made of matter.

Scientists from Fermilab and other U.S. institutions played key roles in the discovery of the Higgs particle at the Large Hadron Collider. They now are upgrading the LHC experiments to take data at higher energy.

Using the cosmos as a laboratory, Fermilab scientists explore dark matter and dark energy, which constitute 96 percent of the universe.

Fermilab innovation

Bold, innovative ideas and technologies from particle physics have entered the mainstream of society to transform the way we live. From enabling the development of MRI machines to building the first proton accelerator for cancer treatment, Fermilab helps overcome the greatest challenges of our time.

Fermilab is a world-leading R&D center for superconducting magnets and superconducting radio-frequency cavities, which are crucial technologies for future particle accelerators. SRF technology has potential applications in medicine, nuclear energy and materials science.

Fermilab trains tomorrow's scientific workforce

Students trained in particle physics find their way to diverse sectors of the national economy in jobs that require highly developed analytical and technical skills, critical thinking and the ability to solve unique problems.

Fermilab inspires the next generation of scientists through its student and teacher programs. About 20,000 K-12 students participate in science education programs and tours at Fermilab every year, and more than 1,000 teachers receive training from experts in the field.

Fermilab projects now under construction will transform science and society.

Neutrino experiments

Fermilab is starting up the NOvA experiment, which will help answer some of the most important scientific questions about neutrino masses, neutrino oscillations and the role neutrinos may have played in the evolution of the universe. One of NOvA's detectors is located in a new underground cavern at Fermilab. The second, near Ash River, Minn., is one of the most sophisticated neutrino detectors built in the world, filled with more than 3 million gallons of liquid scintillator.

Fermilab is advancing plans for the Long-Baseline Neutrino Experiment, which aims to discover whether neutrinos and antineutrinos interact differently with matter. This experiment would send a neutrino beam from Fermilab to a large neutrino detector at the Sanford Underground Research Facility in South Dakota. More than 450 scientists from 85 institutions are collaborating on this experiment.

The MicroBooNE experiment, under construction at Fermilab, will measure neutrino oscillations at short distances and test the liquid-argon detector technology proposed for the LBNE experiment.

Large Hadron Collider research and upgrades

The LHC in Geneva, Switzerland, is the world's highest-energy particle collider. Fermilab is a leader in this international project, serving as the U.S. hub for more than 1,000 scientists working on the CMS experiment at the LHC. Fermilab houses an LHC Remote Operations Center, provides a quarter of the computing power for the CMS experiment and designs and builds components for upgrades to the LHC and CMS.

Illinois Accelerator Research Center

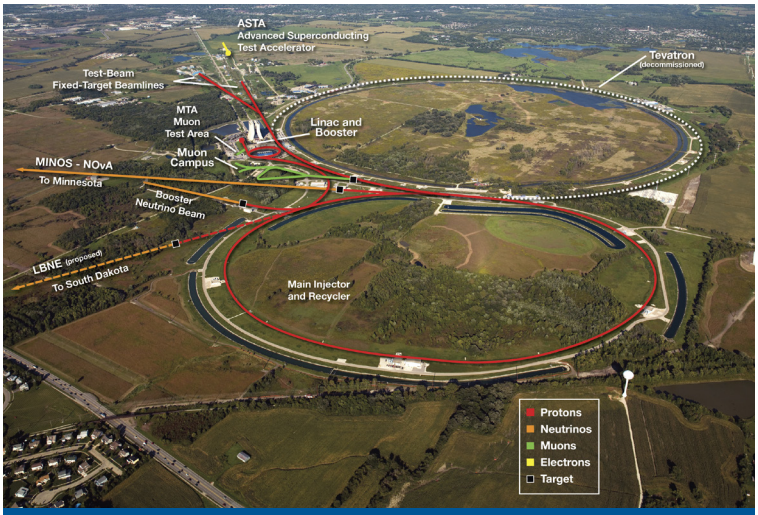
More than 30,000 particle accelerators are in operation today across the world, most in the medicine and manufacturing sectors. A new research center, under construction at Fermilab, will fuel innovation in accelerator technology. The Illinois Accelerator Research Center will bring scientists from Fermilab, universities and industry together to advance R&D for particle accelerators and transition the resulting technologies to the marketplace.

Dark-matter and dark-energy experiments

Scientists only understand about 4 percent of our universe; the rest is dark matter and dark energy, which remain a mystery. The Dark Energy Camera, designed and built at Fermilab, now takes images on a telescope in Chile. The heart of the Dark Energy Survey, it advances the quest to understand the nature of the dark energy that pushes the universe apart. Fermilab also is a leader in experiments that seek to be the first in the world to capture particles of dark matter.

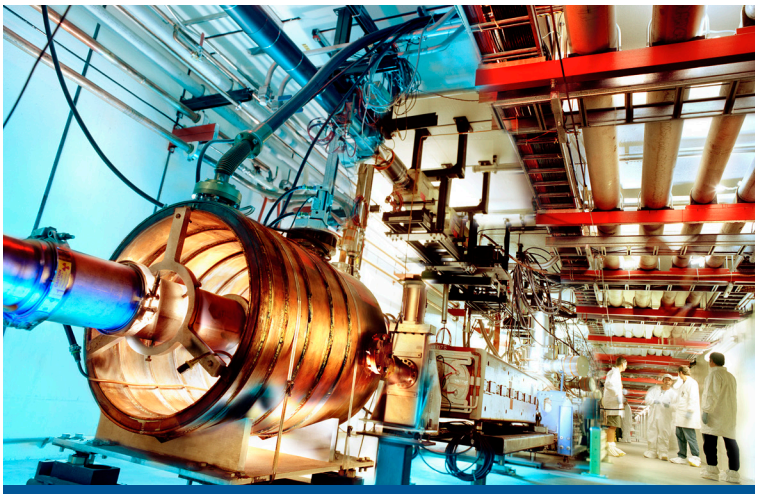
Muon campus

Fermilab has upgraded its accelerator complex to create beams of muons. Scientists plan two experiments, Muon g-2 and Mu2e, that will study these heavy cousins of the electron. Muon interactions could reveal the existence of new particles, forces and laws of nature. The 50-foot-wide electromagnet for the Muon g-2 experiment arrived at Fermilab in the summer of 2013.



The Fermilab accelerator complex supports many different types of experiments and R&D projects.

The new Illinois Accelerator Research Center: space for research, education and industrialization.



Fermilab's Main Injector produces the world's most intense high-energy neutrino beam.